

- 1 1. A method comprising:
2 forming a metal oxide dielectric using a liquid
3 oxidizer.
- 1 2. The method of claim 1 including forming a metal
2 oxide dielectric over a silicon substrate.
- 1 3. The method of claim 2 including forming the metal
2 oxide dielectric of hafnium, zirconium, or tantalum.
- 1 4. The method of claim 1 wherein forming a metal
2 oxide dielectric includes using physical vapor deposition
3 to deposit metal atoms.
- 1 5. The method of claim 1 including using a liquid
2 oxidizer selected from the group including solutions of O_3 ,
3 H_2O_2 and organic peroxide.
- 1 6. The method of claim 1 wherein using a liquid
2 oxidizer includes using an oxidizer in an aqueous solution.
- 1 7. A method comprising:
2 forming a dielectric using a metallic precursor;
3 and
4 oxidizing said metallic precursor in a liquid.

1 8. The method of claim 7 including using a liquid
2 oxidizer.

1 9. The method of claim 7 using an oxidizer in an
2 aqueous solution.

1 10. The method of claim 7 including forming a metal
2 oxide dielectric over a silicon substrate.

1 11. The method of claim 10 including forming a metal
2 oxide dielectric of hafnium, zirconium, or tantalum.

1 12. The method of claim 7 including depositing a
2 metallic film using physical vapor deposition.

1 13. The method of claim 7 including oxidizing using a
2 liquid oxidizer selected from the group including solutions
3 of O₃, H₂O₂, and organic peroxide.

1 14. A method comprising:
2 forming a dielectric using a metal precursor; and
3 oxidizing said metallic precursor in a liquid
4 without forming an oxidized layer under the metallic
5 precursor.

1 15. The method of claim 14 including using a liquid
2 oxidizer.

1 16. The method of claim 14 using an oxidizer in an
2 aqueous solution.

1 17. The method of claim 14 including forming a metal
2 oxide dielectric over a silicon substrate.

1 18. The method of claim 17 including forming a metal
2 oxide dielectric of hafnium, zirconium, or tantalum.

1 19. The method of claim 14 including depositing a
2 metallic film using physical vapor deposition.

1 20. The method of claim 14 including oxidizing using
2 a liquid oxidizer selected from the group including
3 solutions of O_3 , H_2O_2 , and organic peroxide.

1 21. A semiconductor structure comprising:
2 a substrate; and
3 an oxidized metallic layer in direct contact with
4 said substrate.

1 22. The structure of claim 21 without an intervening
2 oxide between said layer and said substrate.

1 23. The structure of claim 21 wherein said metal
2 oxide layer is a metal oxide dielectric layer including
3 hafnium, zirconium, and tantalum.

1 24. The structure of claim 21 wherein said metal
2 oxide layer has a dielectric constant of about 25 or
3 higher.

1 25. The structure of claim 21 wherein said oxidized
2 metallic layer is a gate dielectric.

1 26. The structure of claim 21 wherein the ratio of
2 metal-to-oxygen ions in said metal oxide layer is nearly
3 stoichiometric.